

CITY OF CAMBRIDGE (PWS 3440002)
SOURCE WATER ASSESSMENT FINAL REPORT

June 6, 2001



State of Idaho
Department of Environmental Quality

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for City of Cambridge, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The City of Cambridge drinking water system consists of two well sources. Well #1 is capable of producing 400 gpm and Well #2 can produce 825 gpm. Both wells have moderate ratings in hydrologic sensitivity and moderate ratings for system construction. Both wells have a high susceptibility to inorganic contamination (IOC) and microbial contamination. Nitrates were detected in composite water samples taken in May 1999 and again in February 2001, but at levels far below maximum contaminant levels (MCL). Well #2 has moderate susceptibility to volatile organic contamination (VOC), synthetic organic contamination (SOC). In June 1998, Well #1 water sampling recorded the presence of trace amounts of VOC and SOC. Therefore, Well #1 automatically has a high susceptibility to VOC and SOC.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the City of Cambridge, source water protection activities should focus on implementation of practices aimed at protecting the wellheads and surface seals within the zone immediate to the wells. Urban and residential runoff should be monitored. Spills and accidents from businesses within the jurisdiction of the City should be closely monitored and dealt with. Some of the designated areas are outside the direct jurisdiction of the City of Cambridge. Partnerships with state and local agencies and industry groups should be established and are critical to success. Disinfection practices should be maintained to reduce the risk of microbial contamination. Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission and Gem Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact the Boise Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR CITY OF CAMBRIDGE, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment is also attached.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The public drinking water system for City of Cambridge is comprised of two wells. The City's wells are community wells that serve approximately 383 people through 177 connections. Both wells are located within the City of Cambridge, approximately three blocks apart. (Figure 1).

Significant levels of the inorganic contaminant (IOC) nitrate have recently (2/14/01) been recorded in well #1, but at levels well below the Maximum Contaminant Level (MCL). Trace detections of VOC and SOC have also been detected in the system.

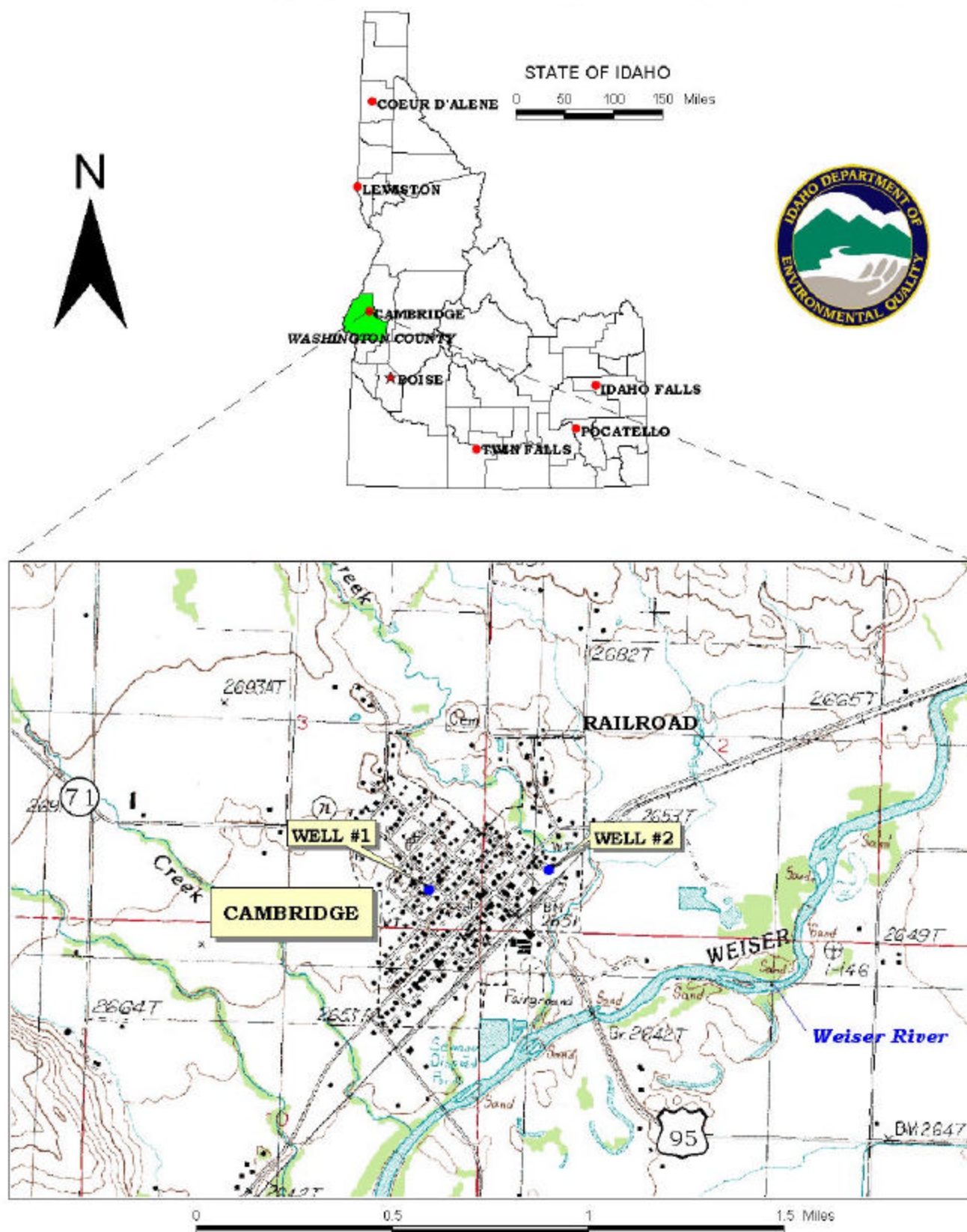
Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Scott Creek – Mann Creek aquifer in the vicinity of City of Cambridge. The computer model used site specific data, assimilated by DEQ from a variety of sources including the City of Cambridge well logs, other local area well logs, and hydrogeologic reports summarized below.

Both wells of the City of Cambridge system take their water from the fractured basalt of the Columbia River basalt aquifer. Geologic formations associated with basalt of the Columbia Plateau are known to yield as much as several hundred gallons per minute (gpm) (IDWA, 1966). The Columbia River basalts are flood type basalts that are dense, exhibit columnar jointing in many places, and are folded and faulted leading to many fracture zones where ground water may collect. (Whitehead and Parlman, 1979). Basalt flows fracture at the surface as they cool. The fractures occur in the horizontal direction throughout the flow. Regional fractures hundreds or thousands of feet long may intersect several flows and have widely varying widths (Lum et al., 1990). The aquifer thickness ranges from 20 to 800 feet and the transmissivity ranges from 2,700 ft²/day to 270,000 ft²/day (Barker, 1979; Cohen and Ralston, 1980). Regional ground water recharge appears to follow the Weiser River valley from north to south.

The delineated source water assessment areas for City of Cambridge wells can best be described as corridors approximately ½ to 1 mile wide and 2 miles long extending north, northeast from the City of Cambridge (Figure 2). The actual data used by DEQ in determining the source water assessment delineation areas are available upon request.

FIGURE 1. Geographic Location of the City of Cambridge



Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

The dominant land use outside the City of Cambridge area is agricultural. Land use within the immediate area of the wellheads consists of residential subdivisions, urban and commercial uses, septic systems, service stations, a major highway thoroughfare and possible residual chemical contamination from a recently abandoned and cleaned up railroad thoroughfare.

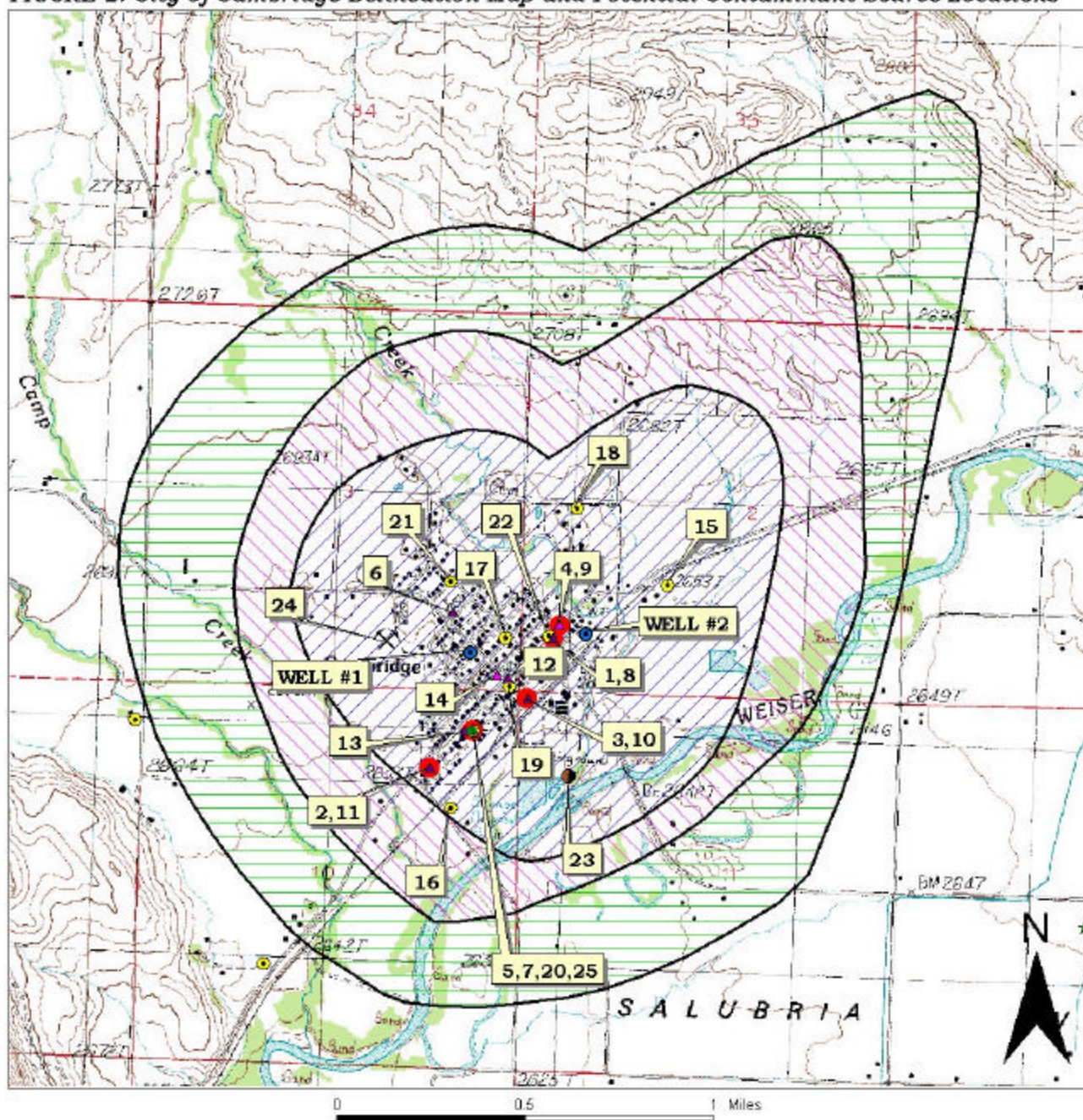
It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination. These involve educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted from December 2000 to January 2001. The first phase involved identifying and documenting potential contaminant sources within the City of Cambridge Source Water Assessment Area through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to validate the sources identified in phase one and to add any additional potential sources in the area. This task was undertaken with the assistance of Ernie Houghton.

Both City wells are in close proximity to one another. Database research indicates that both wells have 26 identical potential contaminant sites including historic leaky underground storage tank sites, other petrochemical storage sites not known to be leaky and other miscellaneous small businesses that have various types of potential contaminants on site. Additionally, the delineation area for both wells is crossed by Highway 95, a potential source for all types of contaminants (Table 1). Figure 2 shows the locations of these various potential contaminant sites relative to the wellheads. The railroad right-of-way depicted in figures 1 and 2 has been abandoned for rail use and is currently used as a pedestrian/cyclist recreational path.

FIGURE 2. City of Cambridge Delineation Map and Potential Contaminant Source Locations



PWS# 3440002
WELL #1 & #2

Table 1. City of Cambridge Wells #1 and 2, Potential Contaminant Inventory

SITE #	Source Description ¹	TOT Zone ² (years)	Source of Information	Potential Contaminants ³
1	LUST – incomplete cleanup	0-3	Database Search	VOC, SOC
2	LUST – incomplete cleanup	0-3	Database Search	VOC, SOC
3	LUST – complete cleanup, impact unknown	0-3	Database Search	VOC, SOC
4	LUST – incomplete cleanup, impact to ground water	0-3	Database Search	VOC, SOC
5	LUST – incomplete cleanup, impact to ground water	0-3	Database Search	VOC, SOC
6	UST – Local Government, closed	0-3	Database Search	VOC, SOC
7	UST – Gas Station, open	0-3	Database Search	VOC, SOC
8	UST – State Gov., closed	0-3	Database Search	VOC, SOC
9	UST – Gas Station, open	0-3	Database Search	VOC, SOC
10	UST – Railroad, closed	0-3	Database Search	VOC, SOC
11	UST – State Gov. closed	0-3	Database Search	VOC, SOC
12	UST – Gas station, closed	0-3	Database Search	VOC, SOC
13	UST – Gas station, closed	0-3	Database Search	VOC, SOC
14	UST – Gas Station, open	0-3	Database Search	VOC, SOC
15	Farm Supplies	0-3	Database Search	IOC, SOC
16	Logging Operation	0-3	Database Search	VOC, SOC
17	Printing Operation	0-3	Database Search	IOC, VOC
18	Printing Operation	0-3	Database Search	IOC, VOC
19	Metal Works	0-3	Database Search	IOC, VOC
20	Auto Repair	0-3	Database Search	IOC, VOC, SOC
21	General Contracting	0-3	Database Search	IOC, VOC, SOC
22	Printing Operation	0-3	Database Search	IOC, VOC
23	WTP	0-3	Database Search	IOC, VOC, SOC
24	Geothermal Site	0-3	Database Search	IOC
25	Farm Supplies	0-3	Database Search	IOC, SOC
26	Highway 95	0-3	Database Search	IOC, VOC, SOC, Microbial

¹ LUST = leaking underground storage tank, UST = underground storage tank,

SARA = Superfund Amendments and Reauthorization Act site

² TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

³ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristic, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

Hydrologic sensitivity is moderate for Wells #1 and #2 (Table 2). This reflects the nature of the soils being in the poorly to moderately well-drained class, the vadose zone (zone from land surface to the water table) being made predominantly of unconsolidated sand and gravel, and the first ground water being located greater than 300 feet below ground surface. Additionally, both wells probably do not have laterally extensive low permeability units that could retard downward movement of contaminants.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. The City of Cambridge drinking water system consists of two wells that extract ground water for residential, commercial, and industrial uses. The well system construction scores are moderate for both wells.

A sanitary survey for both wells was completed in June 1997 to determine if the wells were in compliance with wellhead and surface seal standards. Both wells have concrete block well houses and the well casing raised at least 18 inches above the floor to protect the wells from flooding. Each of the wells has a maintained wellhead seal and a downturned, screened casing vent. Well logs are available for both wells, so a determination was made that the casing and annular seals are not seated in low permeability units and the current public water system (PWS) construction standards are not being met.

Well #1 was initially drilled in 1956 to a depth of 504' and deepened to 929' in 1962. The driller's log has complete geologic data. The hole is cased from top to bottom. The water table was identified at 135 feet and has a static water level of 31 feet.

The Well #2 log indicates that the annular seal extends to 33 feet. This well is artesian with a static water level at surface. The well has 0.375-inch thick, 16-inch diameter steel casing which does not meet current public water system (PWS) construction standards. Though the well may have been in compliance with standards when it was drilled in 1973, current PWS well construction standards are more stringent. The 0.375-inch casing extends from ground surface to a broken basalt layer at 403 feet with no screened intervals throughout the entire expanse of casing. The total depth of the well is 461 feet. Upon completion of the well in 1962 a well test was run for 24 hours resulting in a discharge rate of 824 gallons per minute and 155 feet of drawdown.

Potential Contaminant Sources and Land Use

In terms of land use (see Contaminant Inventory in Table 1 below) Wells #1 and #2 rated high for IOC's (i.e. nitrates) and microbials. Both wells rated moderate for SOC and VOC contaminants. Commercial and industrial land uses in both wells' delineated source areas contributed the largest numbers of IOC, VOC, and SOC points to the contaminant inventory rating. Microbial contamination as well as a variety of other hazardous waste contamination could result from accidental spills along Highway 95 – a major transportation route that passes within 500 feet of Well #1 and 100 feet of Well #2.

Final Susceptibility Ranking

A detection above a drinking water standard MCL or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and much agricultural land contribute greatly to the overall ranking.

Table 2. Summary of City of Cambridge Susceptibility Evaluation

Well	Susceptibility Scores ¹									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Micro bials		IOC	VOC	SOC	Microbials
Well #1	M	H	L	L	H	M	H	H	H	H
Well #2	M	H	L	L	H	M	H	M	M	H

¹H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

Both wells have moderate ratings in hydrologic sensitivity and moderate ratings for system construction. Both wells have a high susceptibility to IOC and microbial contamination. Nitrates have been detected in May 1999 and again in February 2001, but at levels far below MCL. Well #2 has moderate susceptibility to VOC, SOC. In June 1998, Well #1 water sampling recorded the presence of trace amounts of VOC and SOC. Therefore, well #1 automatically has a high susceptibility to VOC and SOC. Commercial and industrial land uses in both wells' delineated source areas contributed the largest numbers of IOC, VOC, and SOC points to the contaminant inventory rating. Microbial contamination as well as a variety of other hazardous waste contamination could result from accidental spills along Highway 95.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For the City of Cambridge, source water protection activities should focus on implementation of practices aimed at protecting the area nearest the wells. The City of Cambridge should also be diligent about local businesses that are regulated by the various environmental regulations (RCRA, CERCLA, SARA) or those with potential inorganic contaminants. Though water quality is generally good for the City of Cambridge, the highly fractured nature of the Columbia River basalt could lead to cross-contamination from shallower fractures to deeper fractures depending on well construction. Any surface releases should be monitored closely to prevent contaminants from infiltrating to the ground water producing zones. Disinfection practices should be maintained to reduce the risk of microbial contamination. Some of the designated areas are outside the direct jurisdiction of the City of Cambridge. Partnerships with state and local agencies and industry groups should be established and are critical to success. Continued vigilance in keeping the wells protected from surface flooding can also keep the potential for contamination reduced. Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission and the local Soil and Water Conservation District, and the Natural Resources Conservation Service.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Boise Regional DEQ Office (208) 373-0550

State DEQ Office (208) 373-0502

Website: <http://www2.state.id.us/deq>

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at (208) 743-6142 for assistance with wellhead protection strategies.

POTENTIAL CONTAMINANT INVENTORY

LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Barker, R.A., 1979. Computer Simulation and Geohydrology of a Basalt Aquifer System in the Pullman-Moscow Basin, Washington and Idaho. U.S. Geological Survey Water-Supply Bulletin No. 48.

Cohen, P.L. and D.R. Ralston, 1980. Reconnaissance Study of the Russell Basalt Aquifer in the Lewiston Basin of Idaho and Washington. Idaho Water Resources Research Institute, University of Idaho, Moscow, Idaho, 165 p.

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho State Department of Agriculture, 1998. Unpublished Data.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Administration, 1966. Groundwater Conditions in Idaho. Water Information Bulletin No. 1.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Idaho Water Resource Board, 1973. Comprehensive Rural Water and Sewerage Planning Study for Washington County. U.S. Geological Survey (prepared in cooperation with University of Idaho, Washington State University and the cities of Moscow, Idaho and Pullman, Washington), Water Resources Investigations Report 89-4103, 73 p.

Lum II, W.E., J.L. Smoot, and D.R. Ralston, 1990. Geohydrology and Numerical Model Analysis of Ground-water Flow in the Pullman-Moscow Area, Washington and Idaho.

Whitehead, R.L. and D.J. Parlman, 1979. A Proposed Ground Water Quality Monitoring Network for Idaho. U.S. Geological Survey (prepared in cooperation with Idaho Department of Health and Welfare, Division of Environment), Water Resources Investigations, Open-File Report 79-1477, 67 p.

Attachment A

**City of Cambridge
Susceptibility Analysis
Worksheet**

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- ≥ 13 High Susceptibility

1. System Construction		SCORE			
	Drill Date	10/25/62			
	Driller Log Available	YES			
	Sanitary Survey (if yes, indicate date of last survey)	YES		1997	
	Well meets IDWR construction standards	NO		1	
	Wellhead and surface seal maintained	YES		0	
	Casing and annular seal extend to low permeability unit	NO		2	
	Highest production 100 feet below static water level	YES		0	
	Well located outside the 100 year flood plain	YES		0	
Total System Construction Score				3	
2. Hydrologic Sensitivity					
	Soils are poorly to moderately drained	YES		0	
	Vadose zone composed of gravel, fractured rock or unknown	YES		1	
	Depth to first water > 300 feet	NO		1	
	Aquitard present with > 50 feet cumulative thickness	YES		0	
Total Hydrologic Score				2	
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
	Land Use Zone 1A	IRRIGATED PASTURE	1	1	1
	Farm chemical use high	NO	0	0	
	IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	YES	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		1	1	1	1
Potential Contaminant / Land Use - ZONE 1B					
	Contaminant sources present (Number of Sources)	YES	10	18	16
	(Score = # Sources X 2) 8 Points Maximum		8	8	8
	Sources of Class II or III leacheable contaminants or	YES	4	10	1
	4 Points Maximum		4	4	1
	Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0
	Land use Zone 1B Greater Than 50% Irrigated Agricultural Land		4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B			16	16	13
Potential Contaminant / Land Use - ZONE II					
	Contaminant Sources Present	YES	2	2	2
	Sources of Class II or III leacheable contaminants or	NO	0	0	0
	Land Use Zone II Greater Than 50% Irrigated Agricultural Land		2	2	2
Potential Contaminant Source / Land Use Score - Zone II			4	4	4
Potential Contaminant / Land Use - ZONE III					
	Contaminant Source Present	YES	1	1	1
	Sources of Class II or III leacheable contaminants or	NO	0	0	0
	Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1
Total Potential Contaminant Source / Land Use Score - Zone III			2	2	2
Cumulative Potential Contaminant / Land Use Score			23	23	20
4. Final Susceptibility Source Score			10	10	9
5. Final Well Ranking			High	High	High

Ground Water Susceptibility Report
CITY OF CAMBRIDGE WELL #2 Public Water System Number 3440002 6/6/01 9:34:09 AM

1. System Construction		SCORE			
	Drill Date	9/7/78			
	Driller Log Available	YES			
	Sanitary Survey (if yes, indicate date of last survey)	YES	1997		
	Well meets IDWR construction standards	NO	1		
	Wellhead and surface seal maintained	YES	0		
	Casing and annular seal extend to low permeability unit	NO	2		
	Highest production 100 feet below static water level	YES	0		
	Well located outside the 100 year flood plain	YES	0		
Total System Construction Score			3		
2. Hydrologic Sensitivity					
	Soils are poorly to moderately drained	YES	0		
	Vadose zone composed of gravel, fractured rock or unknown	YES	1		
	Depth to first water > 300 feet	NO	1		
	Aquitard present with > 50 feet cumulative thickness	YES	0		
Total Hydrologic Score			2		
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
	Land Use Zone 1A	IRRIGATED PASTURE	1	1	1
	Farm chemical use high	NO	0	0	
	IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	NO	NO	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		1	1	1	1
Potential Contaminant / Land Use - ZONE 1B					
	Contaminant sources present (Number of Sources)	YES	10	18	16
	(Score = # Sources X 2) 8 Points Maximum		8	8	4
	Sources of Class II or III leacheable contaminants or	YES	4	10	1
	4 Points Maximum		4	1	
	Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0
	Land use Zone 1B Greater Than 50% Irrigated Agricultural Land		4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B			16	16	13
Potential Contaminant / Land Use - ZONE II					
	Contaminant Sources Present	YES	2	2	2
	Sources of Class II or III leacheable contaminants or	NO	0	0	0
	Land Use Zone II Greater Than 50% Irrigated Agricultural Land		2	2	
Potential Contaminant Source / Land Use Score - Zone II			4	4	4
Potential Contaminant / Land Use - ZONE III					
	Contaminant Source Present	YES	1	1	1
	Sources of Class II or III leacheable contaminants or	YES	1	0	0
	Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1
Total Potential Contaminant Source / Land Use Score - Zone III			7		
4. Final Susceptibility Source Score			10	10	9
5. Final Well Ranking			High	Moderate	Moderate
					High